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links may in itself be a sufficient means of appreciating the appearance of other closely related trains of thought. Under this general position, it remains to interpret the following four characteristics of the results, which may be regarded as the most essential outcome of the study: first, the time of a limited association is longer than the time of a free association (III. is longer than II.); second, univocal association (where the answer is limited to one) is less than the limited, or even than the free (IV. is less than III. or II.); third, by reading a series of words belonging to the same category as the words to be compared, the time of the mental process is much shortened (VI. is less than V., and X. than IX.); fourth, the combination of any two or three factors in the same process takes less time than the sum of the times needed to perform each of the factors separately (VII. is less than the sum of III. and V., less the time of I., which is counted twice). The first fact is not new, and is explained by considering that in both cases, III. and II., several associations present themselves to the mind, but that, while any one of them will answer in II., some may have to be rejected (or the association impulse inhibited) in case III. The second fact is more striking, and seems to mean that the mind does not run over the general category and select the one answering to the particular relation, but takes the nearest and usually prominent association of the limited character. Irrelevant associations do not consciously reach the focus of apperception. The third fact brings out the mechanism of preparation. When a series of words is read, and we know we are to compare some two terms of the series, we anticipate the general kind of comparison, and so shorten the process. We throw out all those associations with the terms in question other than those which they have in common with the series of words read. The fourth fact accentuates the importance of the position that the mind can do more than one thing at a time. If each mental process had to be finished before the next one is begun, such acts as reading ahead, as forming a sentence or an argument while speaking other words, would be impossible. The results distinctly show how the various processes overlap in time, and form that rich complexity of inter-associated and mutually dependent factors that is the charm as well as the strain of mental labor.

**THE NATURE OF NEGATIVE HALLUCINATIONS.**—M. J. Foutan has recently devised an interesting method of showing that in hypnotism the physiological processes remain, while their psychic interpretation is altered. If a subject be told that he sees nothing red, every thing of this color falls out of his mental horizon, and we have an ordinary instance of a negative hallucination. If, now, the red object viewed be a red light, and if we suggest to the subject that when a bell is sounded he will again be restored to normal vision, and if as the bell is sounded the light is put out, the subject sees a light of the complementary color, green, just as he would have done when normally viewing a red light. While the brain refuses passage to the sensation of red, the retina is impressed with it, and re-acts to it, just as though the action were normal in every respect.

#### ELECTRICAL NEWS.

##### The Telephone on Railways.

THERE has been in use on the Austrian State railways a portable telephone that can easily be attached to a passing wire so as to place the trainmen in connection with the neighboring stations. An exhibition of the apparatus was recently made before a number of Austrian railway-men on a line running from Hütteldorf to Purkersdorf, with satisfactory results.

**THE DURATION OF A LIGHTNING-FLASH.**—The researches of Trouvelot, Colladon, and Dufour have shown that the duration of a lightning-flash is not infinitesimal, but that the flash lasts a measurable time. For instance: if one sets a camera in rapid vibration, and exposes in it a plate so as to receive the impression of the flash, it is found that the impressions appear widened out on the negative, showing the negative to have moved during the time the flash was in existence.

ARTHUR WINSLOW has entered upon the duties of State geologist of Missouri, with headquarters at Jefferson City, and the work of the survey is now begun.

#### BOOK-REVIEWS.

*The Struggle for Immortality.* By ELIZABETH STUART PHELPS. New York, Houghton, Mifflin, & Co. 16°. \$1.25.

THIS book is characteristic of the times, and could not have been written at any other period. The authoress is a Christian of the new liberal type, — a type so different from the old that it seems another thing, — and she is a passionate believer in immortality. She presents her views and arguments in an epigrammatic style and generally with clearness, and her book is certainly entertaining. Unhappily she is a pessimist of a rather extreme type, declaring expressly that there is far more pain than pleasure in this life, and consequently, that, if there is no other life before us, God is not good. She admits, however, that with rare exceptions men cling tenaciously to this life, which seems very strange if it brings a surplus of pain. She insists that there is more in man than material forces can account for, and adduces the phenomena of hypnotism and telepathy in support of this claim. Her theory of immortality is as set forth in the following passage: "Immortality is not a right, but a privilege. . . . This gift is offered to you or me upon conditions which we can accept or deny at will. The founder of our religion makes, we may say that he constitutes, the conditions. Everlasting life is, in fact, according to this religion, bestowed by Jesus Christ upon the human soul. The consequence of declining this gift and its conditions would seem to be logically, if not theologically, wrapped in the phrase 'everlasting death'" (p. 137). This means, if we understand it, that, if we live like Christ in this world, we shall live forever in another and happier one; but if not, we shall be annihilated. Hence arises a "struggle for immortality" analogous to the struggle for existence here, in which we may win or lose according to our conduct. This seems to us rather singular doctrine; yet there is much in the book that is both true and valuable, and it will serve to some extent as an antidote to the prevailing spirit of negation.

*A Dictionary of Electrical Words, Terms and Phrases.* By EDWIN J. HOUSTON. New York, The W. J. Johnston Co. 16°. \$2.50.

THE need has long been felt of some work that should give good definitions of the terms which have come into use in the electric science and practice that have been brought into existence mainly within the past ten or twenty years. The larger dictionaries are too slow in adopting new words to serve this special purpose. In fact, some of the terms defined in Houston's "Dictionary" may be out of use, and no longer words in any proper sense as conveyors of ideas, by the time they figure in Worcester or Webster. Such is the march of language with those who are creating apparatus and phenomena never before existing. It is unnecessary to introduce the chief editor of this electrical dictionary to our readers. Professor Houston is too well known to need this. What he has done in the dictionary is, first, to give a concise definition of each word or phrase, and then a brief statement of the principles of the science involved in the definition, that it may be clear, in so little trodden a field, just what the definition means. This statement is frequently illustrated by appropriate cuts. To some extent the short explanations make the work encyclopedic in its character.

This is a first edition, and it may be that the difficulty of introducing a phrase under the most appropriate catch-word, so that it may be readily found, has not been completely overcome; yet such an elaborate system of cross-references has been introduced as to overcome this trouble to a great extent. We must say we have found it satisfactory in use so far.

The publishers are to be commended for the large number of illustrations they have placed at Professor Houston's command.

#### AMONG THE PUBLISHERS.

THERE is announced to appear Nov. 2, 1889, and each Saturday thereafter, *Nature*, a weekly journal for the gentleman sportsman and naturalist, to which the contributing editors will be William C. Harris, Charles Hallock, Charles Barker Bradford, and J. Charles Davis. The articles will include sketches about all kinds of game-hunting; sketches about all kinds of game-shooting; sketches on